Remarks/Arguments

Reconsideration of this application is requested.

Claims 1, 2, 6, 11 and 15 have been rejected by the Examiner as being directed to non-statutory subject matter.

Claims 1 and 11 have been amended so that they and the claims dependent upon them are directed to statutory subject matter.

Claim 1 has been rejected by the Examiner under 35 USC § 102(b) as being anticipated by Davidson (U. S. Patent Application Publication No. 2001/0040979).

Davidson discloses the following in paragraphs 0061 and 0062.

> "[0061) An overall flow diagram for an alternate embodiment of the invention is shown in FIGS. 4A to 5D. The embodiment shown in FIGS. 4A to 5D, takes into consideration the fact that the transfer function of a printer or scanner may differ in the x and y directions. The process begins with a digital image 420A. A watermark is introduced into the image by a watermarking program 421. The water-marking program 421 may for example be the commercially available program "Adobe PhotoShop" which is marketed by the Adobe Corporation. The watermarked image is then printed by a printer 422 resulting in a watermarked physical image 420B.
>
> [0062] The image 42013 is next passed through a scanner 423 to generate a digital image 420C as illustrated in FIG. 4B. The scanner 423 has a transfer function S(u,v) where "u" and "v" are the horizontal and vertical frequency axis. Of particular importance is the fact that the transfer function of scanner 423 differs in the "x" and "y" directions. Furthermore, the transfer function of the scanner is separable in the "ii" and "v" dimensions and the transfer function S(u,v) can be represented as S(u) times S(v)."

Davidson's digital watermarked image is printed without any correction. Davidson processes the scanned image by correction before analyzing for detection of the watermark.

Davidson does not disclose or anticipate the following steps of claim 1 as amended namely, applying a transformation to the watermarked digital image data to produce

transformed watermarked digital image data, the transformation being at least approximately an inverse of a print-scan distortion transformation.

Applicant applies correction to the digital image data before printing. The actual printed and scanned image is analyzed for watermark detection without further processing.

Applicant performs the transformation in the embedding operation instead of the detection operation as disclosed by Davidson for the following reasons:

> "1. Attempting to UN-distort a scanned image will likely destroy, in the process, image information that can be later used for forensic analysis (in case the watermark system found the image to be illegitimate).
> 2. In the postal application the meter manufacturer, is in full control of the embedding process (printing) but has little control over the verifying process (USPS scanning). It is therefore more tricky to impose more operation (the inverse distortion) on USPS for the verification and to keep in control of it (for updates, fine-tuning, etc.).
> 3. The verification is supposed to be done inline at a relatively high speed. Imposing one more operation (the inverse distortion) at that point might slow down the process and that might make the USPS unwilling to use such a system."

Claims 2-5 and 10 have been rejected by the Examiner under 35 USC § 103(a) as being unpatentable over Davidson as applied to claim 1, and further in view of Cook (U.S. Patent No. 5,271,096).

Davidson has been discussed above.

Cook discloses the following in col. 3, lines 16-34.

> "In accordance with the teachings of this invention, a novel computer imaging system and method are taught which allow for calibration of scanners and printers. In one embodiment of this invention, the calibration is performed whereby a calibration image in the system is stored and manipulated as desired, and then printed out as a resultant calibration picture. The resultant calibration picture is then input to the system again to create a resultant calibration image. A comparison is made between the original calibration picture and the resultant calibration picture. This comparison yields calibration data indicating the distortion introduced by the particular hardware and software combination

> used in the calibration process. The calibration data is then used in a correction stage wherein a picture is input to the system, anti-distorted utilizing the calibration data, and an output picture is provided with the anti-distortion causing the output picture to appear substantially identical to the input picture."

Cook discloses a way to perform correction of a scan-print process. Cook utilizes an inverse of the scan-print distortation transformation to obtain a transformed physical picture.

Cook and/or Davidson taken separately or together do not disclose the following step of claim 1 as amended, namely applying a transformation to the watermarked digital image data to produce transformed watermarked digital image data, the transformation being at least approximately an inverse of a print-scan distortion transformation.

Applicant is performing correction in a print-scan process. Applicant utilizes an inverse of the digital print-scan distortation transformation to obtain a transformed watermarked digital image. The transformed watermarked digital image enables more accurate watermark verification. Because the distortation caused by the actual printing and scanning of the watermarked image will be compensated for by the inverse of the digital print-scan distribution transformation.

Claims 6-9 and 11-19 have been rejected by the Examiner under 35 USC § 103(a) as being unpatentable over Carr et. al. (U.S. Patent Application Publication 2003/0130954) further in view of Davidson and Cook.

Carr discloses the following in paragraphs 0025 and 0026.

> "[0025] Some postal meters can provide a "marketing image" in a "marketing space" (and/or a "mailer space") near or adjacent to printed postage indicia. A marketing image can take many forms, e.g., a company logo, graphic, advertisement, design, picture, image, text, indicia, trademark, etc. Postal meters can be loaded or programmed with an appropriate marketing image, which is then printed onto an envelope, sticker or mailing package.
> [0026] Our inventive improvements provide a marketing image that is embedded with steganographic encoding, e.g., in the form of a digital watermark. An advantage of hosting a digital watermark in a marketing image is that the watermark can be added to marketing images without changing the firmware/hardware that are in

> deployed postal meters, since many of the deployed postal meters are typically equipped to process and apply marketing images. Marketing images can be digitally watermarked and stored as an electronic or digital file. The watermarked digital file is then uploaded into a deployed postal meter. The uploading can be accomplished with a communications link, e.g., provided over the internet or network, or through direct communications with a storage module such as a SmartCard, optical disk, magnetic disk, electronic memory circuit, etc."

Carr does not apply a transform and does not disclose my technique to increase the efficiency of watermarking.

Regarding claim 1 as amended and those claims dependent thereon the cited references do not disclose or anticipate the following step of claim 1 as amended, namely, applying a transformation to the watermarked digital image data to produce transformed watermarked digital image data, the transformation being at least approximately an inverse of a print-scan distortion transformation.

Regarding claim 11 as amended and those dependent thereon.

In col. 3, lines 16-34 Cook's transformation is applied to the entire image or picture.

Davidson processes the scanned image by correction before analyzing for detection of the watermark.

The cited references do not disclose or anticipate the following steps of claim 11 as amended, namely applying a transformation to the watermark data to produce transformed watermark data, the transformation being at least approximately an inverse of a print-scan distortion transformation and those claims dependent thereon.

Applicant applies the transformation only to the watermark data. The embedding of the transformed watermark data is done by applicant in the unprocessed digital image data.

Regarding claim 19 and those claims dependent thereon the cited references do not disclose or anticipate the following steps of claim 19 namely, (c) applying a print-scan distortion transformation to the watermarked digital image data to produce transformed watermarked digital image data; (d) retrieving a characteristic of the

watermark as represented by the transformed watermarked digital image data produced at step (c); (g) retrieving a characteristic of the watermark as represented by the scanned image data produced at step (f); and (h) comparing the characteristic retrieved at step (d) with the characteristic retrieved at step (g).

Carr does not apply a transform and does not disclose any technique to increase the efficiency of watermarking.

Davidson takes the print-scan watermarked image and processes it through an inverse digital print-scan transformation before returning the characteristics of the watermark. The characteristics of the watermark is then compared with the characteristics of the unprocessed digital watermark.

Applicant does not do any processing at the same stage as Davidson. Applicant retrieves a characteristic of the watermark and compares it with the characteristics of the watermark from the original digital watermarked image on which print-scan distortation transformation was applied.

Cook uses an inverse digital scan-print transformation to correct on entire picture whereas applicant uses a digital forward print-scan transformation to correct the watermark characteristics against which the actual printing and scanned watermark is being matched.

In view of the above claims1, 2, 4-9 and 11-19 as amended are patentable. If the Examiner has any questions would he please call the undersigned at the telephone number noted below.

Respectfully submitted,

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